Spain: capital Teruel. But if the sea matters, capital Valencia?

A logistical extension of the rational-location model for Spain's capital

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Abstract

A first territorial-location model shows that, if the accumulated effect of Madrid's capital-city status is neutralized by proportionally redistributing among the rest of Spain the population and economic activity concentrated in the province of Madrid, the point that minimizes the combined distance to population and GDP shifts toward the eastern interior of the peninsula. The combined optimum lies at approximately 40.3° N and 1.5° W, very close to Teruel.

This result supports Teruel as a rational inland capital for a Spain not conditioned by Madrid path dependence. However, a modern economy is not a closed system. More than 80% of world merchandise trade by volume is transported by sea, while Spanish ports handle approximately 80% of imports and close to 60% of exports. Access to major maritime infrastructure therefore cannot be treated as a secondary variable in an economic location function.

This paper extends the previous model by incorporating a maritime-logistics variable. The result is particularly clear: if maritime access receives a weight below approximately 12.8%, Teruel remains superior; once that threshold is exceeded, Valencia offers the better location. The 12.8% is not an empirical estimate of the “true value of the sea”, but the mathematical indifference point between the two cities within the proposed function.

A third, independent piece of evidence reinforces this conclusion. If approximately the same number of high-speed-rail kilometres currently existing in Spain are redistributed according to population, economic activity, potential demand, ports and network effects, without imposing Madrid radiality in advance, Valencia spontaneously reappears as one of the main railway nodes on the peninsula. The Great Mediterranean Axis, the Madrid–Cuenca–Valencia link and the Valencia–Teruel–Zaragoza–Ebro–Cantabrian axis converge there.

The most robust institutional reading, however, does not require everything to be reduced to a single city. The same result is compatible with a corridor capital: a more inland administrative and attraction function, around Teruel or at some point on the axis toward Valencia, and a more coastal concentration of port, industrial, commercial and financial functions around Sagunto–Valencia. This would avoid replacing Madrid hyper-centralization with a new one.

This conclusion also has a historical dimension. Both Teruel, within the Kingdom of Aragon, and Valencia, capital of the former Kingdom of Valencia, belonged to the Crown of Aragon. In the Valencian case, this historical asymmetry is compounded by a contemporary fiscal anomaly: different fiscal-balance estimates have repeatedly placed the Valencian Community in a negative balance despite per-capita income below the Spanish average, while the regional-financing system continues to place it among the communities with the lowest effective funding per adjusted inhabitant.

Keywords: Valencia, Teruel, Madrid, capital-city status, maritime logistics, ports, Mediterranean Corridor, Crown of Aragon, fiscal deficit, regional financing, path dependence, railway networks, corridor capital.

1. From the first paper to the second

The starting point of this paper is a previous result.

If we take present-day Spain, exclude the Canary Islands in order to focus on the main terrestrial territorial system, and keep Madrid, the demographic and economic centre lies east of the city of Madrid but still relatively close to it. This is logical: Madrid is now an extraordinary mass, with more than seven million inhabitants at provincial level, a very large share of national GDP, the main seat of the central administration, an exceptional concentration of corporate headquarters, the principal node of the radial railway network and one of Europe's major airport hubs.

But part of that mass is endogenous to capital-city status. That is why, in the first paper, Madrid was neutralized. Its population and economy were not made to disappear: they were redistributed proportionally among the rest of the territory.

$$D_INT(C) = 1/2 \cdot \Sigma_i \, (P_i/P_T) \, d(C,i) + 1/2 \cdot \Sigma_i \, (Y_i/Y_T) \, d(C,i)$$

The function gives equal overall weight to population and the economy. The result was approximately C* ≈ (40.29° N, 1.52° W), that is, the Cuenca–Teruel axis. Among the existing cities analysed, Teruel lay practically on the optimum. This supported the conclusion of the first paper: Teruel = inland capital. But that model deliberately contained a simplification: Spain is not an economic island.

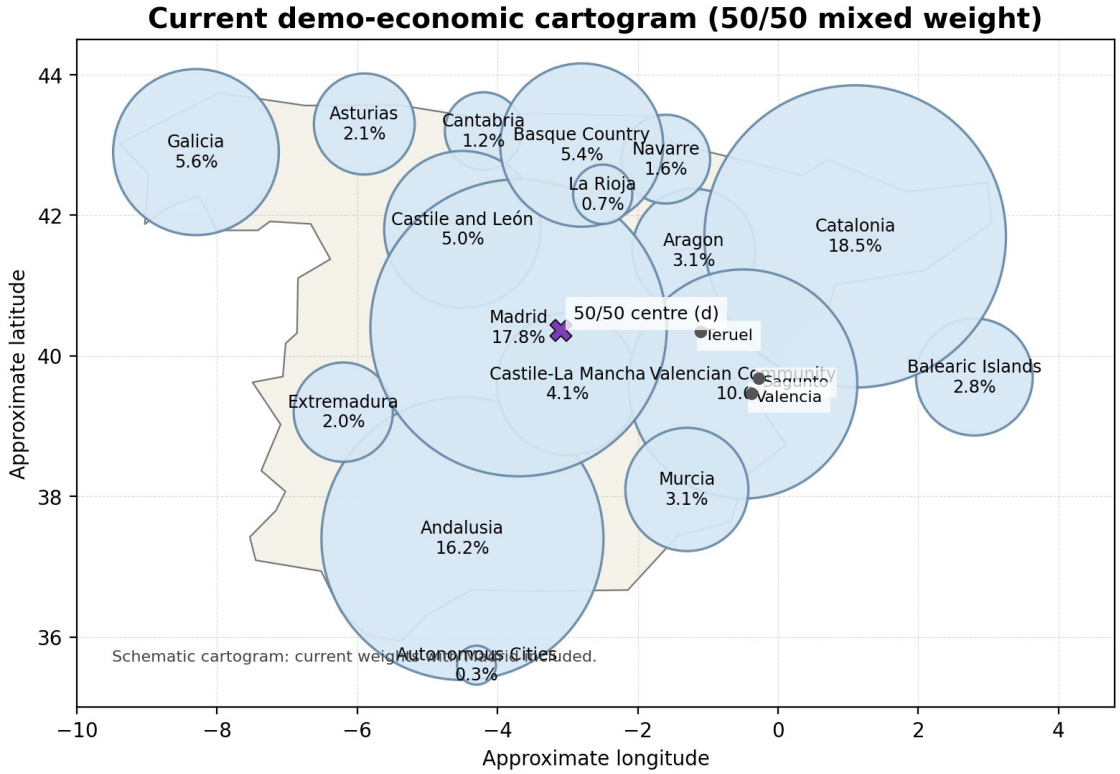

Figure 1. Current demo-economic cartogram (50/50 mixed weight). Visual area represents demo-economic mass, not physical surface area.

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2. The problem with the inland model: most physical world trade travels by sea

Distance from Barcelona to a capital, or from Seville to a capital, matters. But an industrial economy must also import energy, minerals, components, intermediate products, vehicles, machinery and consumer goods. And it must export.

Maritime transport carries more than 80% of international merchandise trade by volume according to UNCTAD. In Spain, Puertos del Estado estimates that ports of general interest handle approximately 80% of imports and 60% of exports. In the strictly inland model we had implicitly assigned $\gamma_{mar} = 0$: being beside a major port or 300 km away counted exactly the same.

For a purely administrative capital, that simplification can be defended. For a capital conceived also as an economic, industrial and logistical centre, it is far less plausible.

3. How to introduce the sea without rigging the result

The point is not to declare arbitrarily that Valencia has the sea and therefore must win. A variable has to be constructed.

$$D_G(C) = \text{distance to a major international container gateway port}$$

$$D_I(C) = \text{distance to major industrial port infrastructure}$$

$$D_M(C) = 1/2\, D_G(C) + 1/2\, D_I(C)$$

This specification assigns equal weight to global container connectivity and industrial port capacity. It is not the only possible specification; precisely for that reason a sensitivity analysis is useful. But it provides a transparent and replicable first function.

4. Teruel versus Valencia

In the previous inland model we obtained approximately $D_{INT}(\text{Teruel}) = 352.0$ km and $D_{INT}(\text{Valencia}) = 367.6$ km. Without considering the sea, Teruel wins. Teruel's inland advantage is therefore 15.6 km of equivalent average cost.

But in maritime accessibility the relationship is radically reversed. With the maritime index used, $D_M(\text{Teruel}) \approx 112.6$ km, while $D_M(\text{Valencia}) \approx 5.9$ km. Valencia therefore recovers 106.7 km in the maritime dimension.

From this point on, there is no need to decide subjectively which city wins. We can ask what weight the sea must have for Valencia's maritime advantage to compensate for Teruel's 15.6 km inland advantage.

5. The extended function

$$J_\gamma(C) = (1-\gamma)\, D_{INT}(C) + \gamma\, D_M(C)$$

Here $0 \le \gamma \le 1$ represents the importance of the maritime dimension. If $\gamma = 0$, only inland centrality matters and Teruel wins. If $\gamma = 1$, only the port matters and Valencia wins. The relevant question is to find γ^* such that $J_{\gamma^*}(\text{Teruel}) = J_{\gamma^*}(\text{Valencia})$.

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$$(1-\gamma)\cdot 352 + 112.6\gamma = (1-\gamma)\cdot 367.6 + 5.9\gamma$$

$$\gamma^* \approx 0.1276 \approx 12.8\%$$

This is the central result of the second paper.

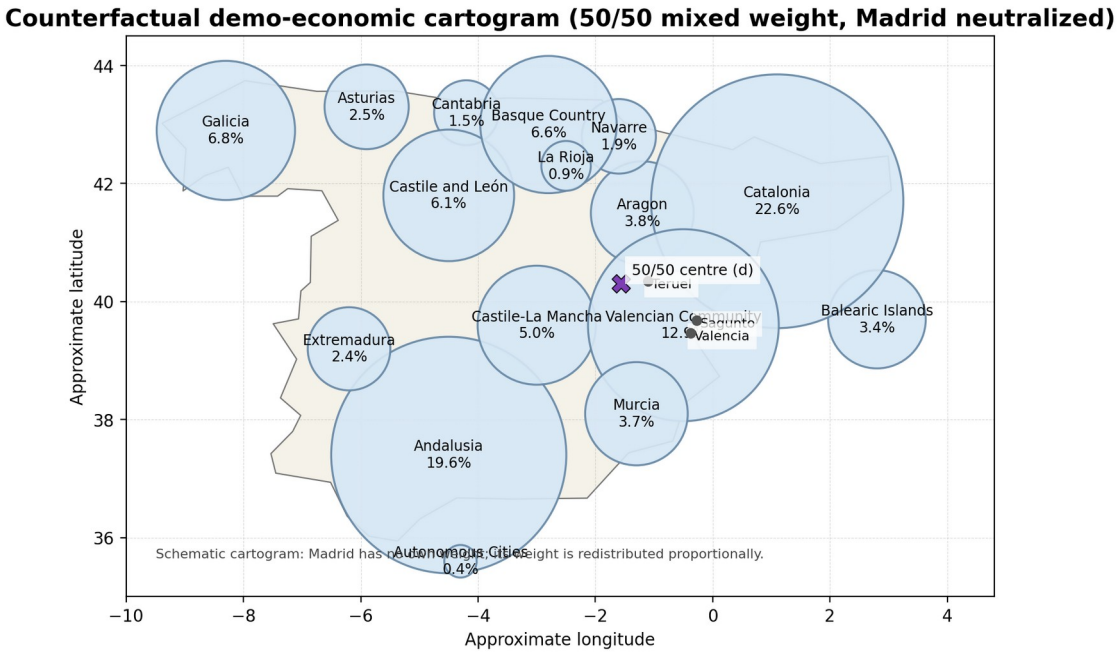

Figure 2. Counterfactual demo-economic cartogram (50/50 mixed weight, Madrid neutralized). Visual size represents population + GDP and shows the shift of centrality toward the eastern interior.

6. The sea only needs to matter by 13%

The interpretation is extremely simple. If $\gamma < 12.8\%$, Teruel wins. If $\gamma > 12.8\%$, Valencia wins. It is not necessary to claim that maritime logistics accounts for half of the economy, or 30%, or even 20%. It is enough to defend a weight of roughly 13% in the location function.

This 13% must not be confused with the fact that more than 80% of world merchandise trade by volume travels by sea. We cannot infer that 80% maritime merchandise implies an 80% weight in the choice of a capital. That would be methodologically incorrect. The 80% figure merely shows that treating the sea as a first-order economic factor is entirely reasonable. Our conclusion is much more modest: it is enough for this first-order factor to be worth 13% for Valencia to overtake Teruel.

7. Valencia does not merely “have the sea”: it has Valenciaport

This distinction matters. The result would not be justified in the same way by locating the capital at just any point on the coast. Valencia has exceptional port infrastructure.

Valenciaport handled approximately 5.66 million TEU and 80.1 million tonnes of goods in 2025, reaching a new all-time high in containers. Its main trade relationships include major world

markets such as China, Italy and the United States. We are therefore not merely introducing the value of “seeing the sea”, but direct access to global logistics infrastructure.

8. Valencia is also a potential European railway crossroads

The second dimension is rail. Spain's railway system has historically been highly radial. That radiality makes Madrid appear to be an indispensable node even when economic flows could operate transversally.

The map that motivates this paper —a graphic proposal for an alternative high-speed network— illustrates another philosophy: connecting major territorial axes to one another instead of forcing them through the political centre. The image is not, by itself, a quantitative proof, but the intuition has a real economic basis.

It is therefore a port → industry → rail → European market corridor, rather than simply a passenger line.

9. The radial model and the corridor model

Two territorial philosophies can be represented. The radial system tends toward A → Madrid → B even when A ↔️ B is the economically relevant flow. A corridor network instead tends to articulate the Mediterranean, the Ebro valley, the Cantabrian coast, the Atlantic and Andalusia through transversal connections.

In this scheme, Valencia is particularly powerful because it lies at the intersection of the Mediterranean Corridor, the Valencia–Teruel–Zaragoza axis, the connection with Madrid and the Meseta, the axis toward Alicante–Murcia–eastern Andalusia, and global maritime routes.

10. Teruel–Valencia as a system

The spatial conclusion can in fact be interpreted as a corridor: Zaragoza ↔️ Teruel ↔️ Sagunto ↔️ Valencia. Teruel is the point that best balances the interior. Valencia is the point that connects that interior with the global maritime system.

This explains why a relatively small change in the objective function produces the switch between the two. They are not geographically random alternatives. They are two expressions of the same eastern centrality.

Moreover, this reading opens an institutional alternative: not every capital function has to be forced into a single municipality. A planned administrative capital in the interior could coexist with a stronger concentration of industrial, commercial, port and financial functions toward Sagunto–Valencia.

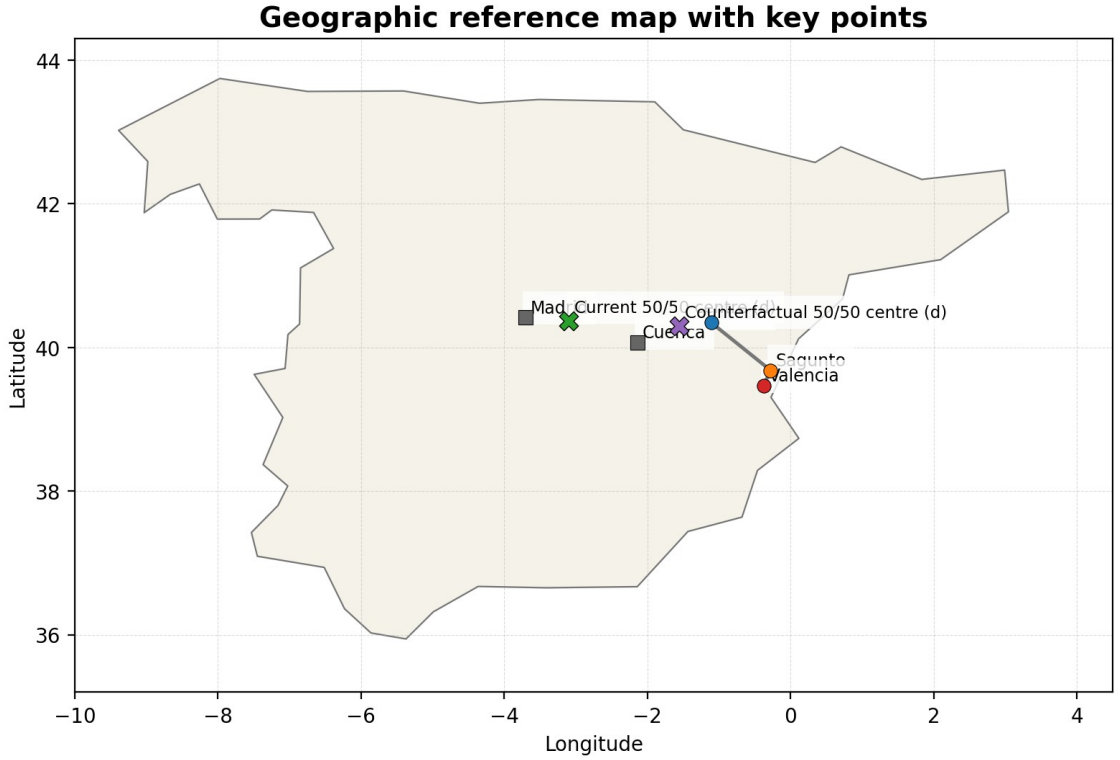

Figure 3. Geographic reference map: Madrid, Cuenca, Teruel, Sagunto, Valencia and the current and counterfactual mixed centres.

11. A third test: redesigning the high-speed network from scratch

We can subject the Valencian candidacy to an additional test based on a completely different question. Imagine that we are not trying to decide where the capital should be. Imagine simply that we have approximately the same number of high-speed kilometres that Spain has today and can redistribute them from scratch.

We assign no points for being the national capital. Nor do we decide in advance that Valencia, Teruel or any other city must be a node. The sole question is: what network would we build if we sought to maximize the usefulness of the same number of kilometres of track using population, economic activity, potential demand, ports and network effects?

$$M_i = 1/2 \cdot P_i/P_T + 1/2 \cdot Y_i/Y_T$$

$$Q_{ij} = K \cdot (M_i\, M_j) / d_{ij}\text{^}\beta$$

$$\max_N\ \Sigma_{ij}\, Q_{ij}\, [GC^0_{ij} - GC^N_{ij}],\ \text{subject to}\ L(N) \le L_AVE$$

The principle is important: first build the network; then observe which nodes emerge. Not the other way around.

12. The network that emerges is not a star

A first heuristic redistribution of roughly four thousand current high-speed kilometres produces a network structured around major corridors.

The first is a Great Mediterranean Axis: France–Girona–Barcelona–Tarragona–Castellón–Valencia–Alicante–Murcia–Almería–Granada–Málaga–Algeciras. The second retains, because demand justifies it, the Madrid–Zaragoza–Lleida–Barcelona connection. The third is Madrid–Cuenca–Valencia. The fourth retains the major Andalusian axis Madrid–Córdoba–Seville, with a Córdoba–Málaga branch.

At the same time, however, a connection that has far less prominence in a purely radial network appears: Valencia–Teruel–Zaragoza, continuing toward Pamplona–Vitoria–Bilbao and articulating with the Cantabrian axis. The fundamental difference is topological: the network ceases to be a star and becomes a mesh of corridors.

13. And Valencia appears again

This experiment has an important property. We have not introduced “Valencia must be the capital” as a constraint. And yet Valencia reappears in several independent corridors.

First, Barcelona–Tarragona–Castellón–Valencia–Alicante–Murcia–eastern Andalusia: the great Mediterranean corridor. Second, Madrid–Cuenca–Valencia, which remains a rational connection given Madrid's real demographic and economic mass. Third, Valencia–Teruel–Zaragoza–Ebro–Basque Country creates a major Mediterranean–Cantabrian axis. Valencia thus appears as a network hinge.

14. Madrid remains important, but it no longer defines the geometry

This qualification is essential. A rational model cannot artificially remove Madrid from the present railway network. Its demographic mass is real. Demand on Madrid–Barcelona is enormous. Madrid–Valencia is also strong, and Madrid–Andalusia likewise justifies high-capacity infrastructure.

A rational network would therefore continue to include major Madrid lines. The difference is another one: it would not assume that every important connection must pass through Madrid. The problem is not the existence of efficient radial routes. The problem is making radiality the organizing principle of the whole system.

15. Madrid is the centre of a star; Valencia can be a node in a mesh

Madrid centrality fits a radial structure extraordinarily well: A → Madrid ← B. Madrid is necessarily central because the geometry of the system makes it so. But a polycentric network behaves differently. Centrality depends on being located at the intersection of several independent flows.

Here Valencia has a singular combination: north–south Mediterranean + Madrid–Meseta east–west + Teruel–Zaragoza–Ebro–Cantabrian + port and maritime transport. It is a less radial and more reticular form of centrality.

16. The convergence of three independent models

This is probably one of the most interesting arguments in the paper. Valencia does not appear only once, but through three different exercises.

Model 1. Inland centrality: neutralize Madrid and minimize distance to population and GDP. Inland optimum ≈ Teruel. Model 2. Centrality + maritime logistics: add the cost of access to ports. $\gamma > 12.8\% \rightarrow$ Valencia. Model 3. Non-radial rail network: keep approximately the same number of high-speed kilometres but redistribute them according to functional corridors. Valencia emerges as one of the main nodes.

The three questions are different. That is precisely why the convergence is interesting. The conclusion no longer depends merely on saying that “Valencia has a major port”. It is deeper: Valencia lies where the eastern inland centre, the main maritime arc, several of the strongest land corridors and the connection between the Mediterranean, the Meseta and the Ebro valley tend to converge.

17. A network capital, not a new radial capital

This conclusion also avoids a conceptual error. The proposal should not consist of replacing Madrid radiality with Valencian radiality. That would reproduce the same problem. Valencia's rationale is more interesting if it is conceived as a node in a polycentric structure.

A Spain articulated by corridors could have Barcelona↔Valencia↔Murcia↔Andalusia; Valencia↔Teruel↔Zaragoza↔Basque Country; Valencia↔Madrid; Madrid↔Zaragoza↔Barcelona; Madrid↔Andalusia; and other Atlantic and Cantabrian corridors. The system gains redundancy, triangles and alternative routes. The network becomes less dependent on a single point.

This same logic allows capital functions to be distributed along the Teruel–Sagunto–Valencia corridor. The principal administrative seat can be inland and planned; ministries and bodies most directly linked to trade, industry, ports and external projection can be located closer to the coast. The purpose is not fragmentation for its own sake, but avoidance of reproducing the same over-concentration at another point.

18. The railway map as a figure of the model

The alternative map is not a definitive demonstration that every kilometre shown is exactly optimal. Proving that would require complete origin-destination matrices, potential demand, travel times, topography, real construction costs, operating costs, congestion, frequencies, effects on freight and European connections.

Its strength does not lie in the precision of every alignment but in the structural result: the backbone ceases to be exclusively Madrid-centred and becomes strongly Mediterranean and transversal, and Valencia appears as one of the main intersections in the new mesh.

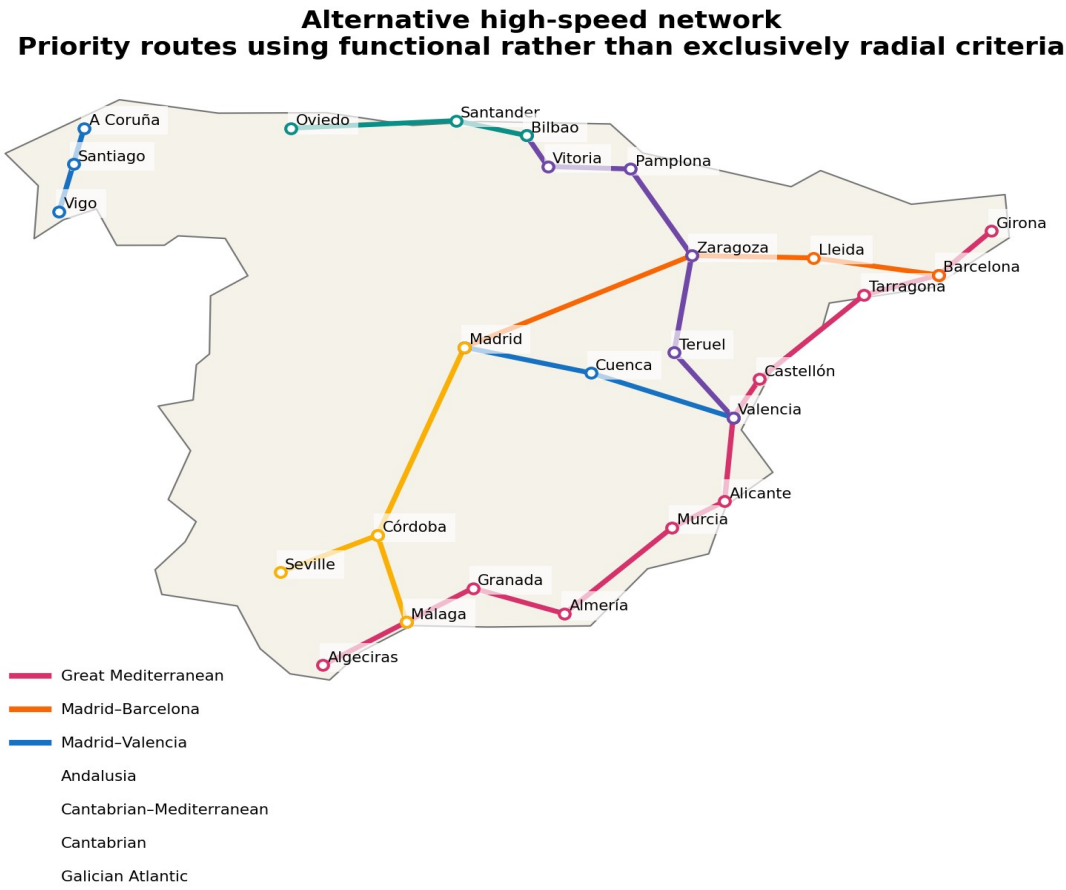

Figure 4. Alternative high-speed network based on functional rather than exclusively radial criteria.

19. Valencia as capital of a non-radial Spain

A Valencia-capital would allow us to imagine a network structured around several major axes: Barcelona–Tarragona–Castellón–Valencia–Alicante–Murcia–Almería–Málaga as the great Mediterranean spine; Valencia–Teruel–Zaragoza as the axis toward the Ebro valley and the north; and transversal links toward Madrid, Castile-La Mancha, Andalusia, the Cantabrian coast and the Atlantic.

There would be no need to replace Madrid centralism with Valencian centralism. The very logic of the model suggests the opposite. Valencia would work better as a node in a polycentric network than as the centre of a new radial network.

20. A capital in Valencia and the former Crown of Aragon

There is also a historical dimension that does not determine the mathematical result but does change its political interpretation. Valencia was the capital of the Kingdom of Valencia, one of the constituent territories of the Crown of Aragon. Teruel belonged to the Kingdom of Aragon. Both alternatives therefore place the centre of the state within the historical space of the former Crown of Aragon.

This is especially significant because the development of the modern centralized state involved precisely the disappearance of many of these territories' own political structures.

21. Valencia and 1707

The Valencian case is particularly clear. The 1707 Nueva Planta Decree abolished the Fueros of Aragon and Valencia and subjected these territories to the new Bourbon centralizing order. The Nueva Planta meant the disappearance of the public legal order and political institutions of the former Kingdom of Valencia.

Moving the capital toward Valencia today would therefore carry an evident historical irony. A territory that lost its institutions in the process of building the centralized state would come to occupy its political centre. It would not be a legal restoration of the former Kingdom of Valencia or a reconstruction of the Crown of Aragon, but rather a symbolic reversal of the historical direction of centralization.

22. The fiscal dimension: an asymmetry particularly visible in Valencia

This historical dimension must not be mechanically conflated with contemporary taxation. There is no simple causal line 1707 → present fiscal deficit. That would be excessive. But there is a politically relevant continuity in the perception of territorial asymmetry, and the Valencian case displays particularly singular data.

Fiscal-balance estimates normally show an intuitive relationship: higher per-capita income → greater probability of a negative fiscal balance. That is consistent with a progressive and redistributive tax system. Richer territories contribute more; poorer territories receive more. But Valencia has repeatedly been an exception.

23. The Valencian case: fiscal deficit without being a rich region

The Territorialized Public Accounts analysed by FEDEA explicitly identified a striking situation: Valencia showed an appreciable fiscal deficit despite having GDP per capita below the Spanish average. This was not merely the result of a single year; analyses of different years retained this Valencian singularity.

Under some cash-flow methodologies, the Valencian Community has appeared with a substantial negative fiscal balance despite not belonging to the group of highest-income communities. The precise figure varies by methodology and year and should therefore not be treated as an exact

structural constant. But the qualitative singularity repeatedly appears: Valencia = below-average income + negative fiscal balance.

24. And it remains underfunded today

A fiscal balance must be distinguished from regional financing. They are not the same. The former compares territorially the revenues and expenditures of the central public sector. The latter studies the resources that the financing system provides to a region to exercise certain powers.

Yet the second indicator has also repeatedly shown a Valencian problem. The Valencian Community has persistently ranked among the common-regime regions with the lowest effective resources per adjusted inhabitant. And this occurs while it is not one of the richest regions either.

This is probably the strongest fiscal argument in the paper. There is no need to claim that "Valencia pays because it is rich". The anomaly is precisely the opposite: the Valencian case is singular because it has been able to appear as a net contributor in fiscal-balance estimates without having per-capita income above the average, while simultaneously occupying very low positions for years in regional financing per inhabitant.

25. The former Crown of Aragon and lost centrality

A simplification should be avoided here. Not all the former territories of the Crown of Aragon have the same fiscal balance. Aragon, Catalonia, the Balearic Islands and Valencia have different economic structures and fiscal positions.

But it is true that some of the principal Mediterranean territories of the former Crown — especially Catalonia, the Balearic Islands and Valencia— have recurrently appeared as net contributors under various fiscal-balance years and methodologies. In Catalonia and the Balearics this can be explained to a significant extent by income above the average. What makes Valencia especially interesting is that this explanation is insufficient.

This fits a more general thesis of the paper: Spain's current territorial geography is not simply the neutral product of population, markets and distances; it is also the result of accumulated institutional decisions.

26. From radial Spain to corridor Spain

The railway question allows us to return to the original problem from another angle. The map that gives rise to this discussion represents a Spain organized around corridors of population and activity, rather than a Spain in which connections tend to use Madrid as their primary reference.

The difference can be summarized as follows: radial model = connect the territory with the capital; corridor model = connect territories with one another. The second model does not imply eliminating Madrid. It means avoiding Madrid as a compulsory connectivity condition between territories that may have more rational direct flows.

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Madrid retains the connections justified by its demand. But Barcelona, Valencia, Zaragoza, Bilbao, Murcia, Málaga and Seville can interact through major axes that do not need to pass through Madrid. It is in this geometry that Valencia again gains centrality.

27. Why not Castellón?

The maritime model also brings Castellón very close. This is logical. Castellón combines proximity to the Teruel–Cuenca centre with an important industrial port and is also part of the same Great Mediterranean Axis.

But Valencia offers much stronger agglomeration economies: metropolitan scale, international container port, airport, universities, advanced services, a larger labour market, rail centrality and institutional capacity. For that reason, when moving from a purely geometric model to a model of a real capital, Valencia provides a more complete solution.

28. Why not keep Teruel and connect it with Sagunto?

This is a much stronger objection. In fact, it is entirely plausible. Teruel is little more than one hundred kilometres from the Valencian coast and has a direct railway connection with Sagunto.

We could imagine Teruel + Sagunto + Valencia as a single functional system: Teruel as political and administrative capital; Valencia–Sagunto as economic, port and logistics capital. This solution would preserve the inland optimum and substantially reduce the maritime disadvantage.

It is probably the strongest objection to the Valencia result and, at the same time, a natural extension of the model itself. When the model is forced to choose one point and maritime logistics receives a weight above approximately 13%, Valencia beats Teruel. But if a polycentric or corridor capital is allowed, the Teruel–Sagunto–Valencia axis may be even more rational than either endpoint separately.

29. The meaning of 13%

This is probably the most important number in the whole paper. Not because 13% is a universal constant, but because it is small. If the model required $\gamma > 60\%$, the Valencia conclusion would be weak: we would have to claim that almost everything depends on the sea. But the threshold is $\gamma \approx 13\%$.

This means Valencia can afford to be slightly worse than Teruel with respect to the inland centre because it is vastly better with respect to maritime trade. The relationship is approximately 15.6 km of inland disadvantage versus 106.7 km of maritime advantage. A modest weighting is therefore enough to reverse the result.

30. Sensitivity analysis

Maritime weight	Result

0%	Teruel
5%	Teruel
10%	Teruel
12%	Teruel, by very little
12.8%	Indifference
13%	Valencia, by very little
15%	Valencia
20%	Valencia
25%	Valencia

The conclusion therefore does not depend on choosing exactly 13%. What we have is a boundary: on one side, inland priority → Teruel; on the other, global logistics priority → Valencia. If functions are allowed to be distributed, this boundary is even better interpreted as a transition along the corridor, rather than as a binary jump between two cities.

31. A question of territorial justice

The first paper started from a democratic question. It is difficult to defend the idea that the political location of a democracy should be considered immutable simply because a monarch decided to establish the Court in Madrid in 1561. The second adds a question of territorial justice.

Centralization creates winners and losers. When the state concentrates administration, headquarters, infrastructure, public employment, regulators and communications in one territory, it helps create agglomeration economies there. Those economies are then presented as a justification for continuing to concentrate resources there.

The Mediterranean territories of the former Crown of Aragon provide an obvious historical counterpoint because they had their own political, commercial and maritime traditions before the formation of the modern centralized state. The point is not to replace one historical narrative with another, but to observe that the present configuration is neither neutral nor inevitable.

32. The Valencian paradox

Valencia summarizes this contradiction particularly well. It is one of Spain's major metropolitan areas; a major export platform; home to the state's leading container port; a central part of the European Mediterranean Corridor; a natural node in a non-radial peninsular railway network; a territory with per-capita income below the average; a region that repeatedly appears near the bottom of the financing system; and a territory that, in several fiscal-balance studies, has shown a negative balance despite that lower income.

It is difficult to find a clearer example of the difference between potential economic centrality and effective political centrality.

33. Four arguments converging eastward

First: the current centre is not necessarily equivalent to the city of Madrid. Even when Madrid's concentration is fully maintained, demographic, economic and minimum-distance centres can lie east of Madrid. Madrid remains very close to the optimum because it is itself an enormous attractor.

Second: once Madrid is neutralized, the centre jumps toward Teruel. When Madrid's population and GDP are redistributed proportionally, the inland centre → Cuenca–Teruel. Teruel lies practically on the optimum among the existing cities analysed.

Third: once the sea is introduced, Valencia beats Teruel with only 13%. When maritime logistics is incorporated, $\gamma \gtrsim 12.8\%$ produces Valencia.

Fourth: when the railway network is redesigned, Valencia emerges again. When we forget the capital and simply search for rational corridors, Valencia again becomes one of the main intersections. The importance of this sequence is that the arguments are partly independent. They are not four ways of repeating the same premise, but four different questions that end up pointing in a similar geographic direction.

34. Conclusion

The first model gave an answer: Teruel. When we removed the accumulated effect of Madrid and asked which point minimized distance to Spain's population and economy, the centre shifted to the Cuenca–Teruel axis.

But that model treated Spain as if the world ended at the Pyrenees and the coast. The second model opens the system. It introduces ports, logistics and the fact that more than 80% of world merchandise trade by volume travels by sea. A quantitative question then appears: how much must the sea matter for Valencia to overtake Teruel? The answer is approximately 12.8%.

There is no need to give the sea most of the function, or even a quarter. Roughly one eighth is enough. Then: inland centrality + maritime logistics → Valencia.

But the result does not end there. When we ask a third independent question —how would we distribute approximately the same number of high-speed kilometres if we assigned them according to potential demand, population, economy, ports and network effects, without imposing radial geometry?— Valencia appears again. It appears on the great Mediterranean axis, as Madrid's natural connection to the Mediterranean, as the maritime outlet of Teruel and Zaragoza, and as a hinge between the Mediterranean, the Meseta, the Ebro and the Cantabrian coast.

The Valencia case therefore no longer rests only on a major port. It rests on a convergence: proximity to the inland centre + global port + Mediterranean corridor + network rail centrality.

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And the historical coincidence is difficult to ignore. The first solution, Teruel, belongs to the former Kingdom of Aragon. The second, Valencia, was the capital of the former Kingdom of Valencia. Both belong to the historical space of the Crown of Aragon. Both shift eastward a political centre that for centuries has been built radially around Madrid.

The fullest institutional reading can ultimately avoid a false dilemma. If Spain looks inward: Teruel. If Spain also looks outward to the world: Valencia. If Spain wants to avoid repeating hyper-centralization while taking advantage of both logics: a Teruel–Sagunto–Valencia corridor with functions distributed according to their territorial rationale.

Madrid is extraordinarily central within a system built over centuries to make Madrid central. When we change the question —first neutralizing that concentration, then opening Spain to the sea and finally redesigning land connections without imposing radiality— the map repeatedly begins to point eastward. Teruel appears as the inland centre. Valencia appears as its great maritime, economic and railway projection. Spanish geography does not require everything to pass through Madrid. Political history has accustomed us to looking at the map in that way.

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